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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/647,475		Olav K. Lyngberg	110.00810101	7111

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MUETING, RAASCH & GEBHARDT, P.A.
P.O. BOX 581415
MINNEAPOLIS, MN 55458

EXAMINER

CHEU, CHANGHWA J

ART UNIT PAPER NUMBER

1641

DATE MAILED: 03/11/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/647,475

Applicant(s)

LYNGBERG ET AL.

Examiner

Jacob Cheu

Art Unit

1641

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 December 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-24, 48 and 100-110 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-24, 48 and 100-110 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: _____

Art Unit: 1641

DETAILED ACTION

Applicant's amendment filed on 12/15/2004 has been received and entered into record and considered.

1. Claims 1-4, 11, 12, 14, 16, 18, 22, 109, and 110 are amended.
2. Claims 1-24, 48, 100-110 are under examination.

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 1-24, 48 and 100-101 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

With respect to claim 1, line 3, "nonporous latex-derived material" is vague and indefinite. It is not clear what is this "nonporous latex-derived" material. It is not clear what is the metes and bounds of such derivative materials.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Art Unit: 1641

2. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3. Claims 1-13, 15-24, 48, 100-104, 106-108, 110 are rejected under 35 U.S.C. 103(a) as being unpatentable over Thiagarajan et al. (Euro. Federation Biotech. 1995, page 304) in view of Foster et al. (US 4444879).

Thiagarajan et al. teach immobilizing metabolically viable bacteria on a composite biostructure, i.e. biofilm, for measuring oxygen consumption. (See Introduction) Thiagarajan et al. teach mixing E. Coli with porous latex polymers and to form a biofilm bacteria/latex biostructure (See page 306, last paragraph). The biofilm can be activated upon hydration (See page 305, first-fourth paragraph). However, Thiagarajan et al. do not explicitly teach that the device contains at least a portion of a nonporous latex-derived material.

Foster et al. teach a widely use polymeric resins, i.e. nonporous carboxylated styrene-butadien latex polymers, as the immobilizing substrates in the form of test tube, microtiter plates, "dipsticks", or similar configuration to increase the adsorption of the biological materials on the substrate (Col. 2, line 20-40; See Example 1). Therefore, it would have been obvious to one ordinary skill in the art at the time the invention was made to have provided Thiagarajan et al. with the nonporous styrene latex as taught by Foster et al. as substrates to coat upon the biostructure to increase adsorption of the bacteria on the growth plate for more efficient detection.

Art Unit: 1641

With respect to the feature of “wherein the biostructure is *obtainable* by process of gravure coating, piezo-electric printing or acoustic printing”, the device of Thiagarajan et al. is inherently obtainable by the recited process. The case law has established that the production of a product by a particular process does not impart novelty or unobviousness to a product when the same product is taught by the prior art—“[Where] the claimed and prior art products are identical or substantially identical in *structure or composition*, or are produced by identical or substantially identical processes, a prima facie case of either anticipation or obviousness has been established.” *In re Best*, 562 F.2d 1252, 1255, 195 USPQ 430, 433 (CCPA 1977)(emphasis added). This is particularly true when the properties of the product are not changed by the process in an unexpected manner. See *In re Thorpe*, 227 USPQ 964 (CAFC 1985); *In re Marosi*, 218 USPQ 289, 292-293 (CAFC 1983); *In re Brown*, 173 USPQ 685 (CCPA 1972). Therefore, even if a particular process used to prepare a product is novel and unobvious over the prior art, the product *per se*, even when limited to the particular process, is unpatentable over the same product taught by the prior art. See *In re Kind*, 207 F.2d 618, 620, 43 USPQ 400, 402 (CCPA 1939); *In re Merz*, 97 F.2d 599, 601, 38 USPQ 143, 144-145 (CCPA 1938); *In re Bergy*, 563 F.2d 1031, 1035, 195 USPQ 344, 348 (CCPA 1977) *vacated* 438 U.S. 902 (1978); and *United States v. Ciba-Geigy Corp.*, 508 F. Supp. 1157, 1171, 211 USPQ 529, 543 (DNJ 1979).

With respect to claims 4-5, the biostructure taught by Thiaragian et al. contains less than 75% by volume of biological materials (See Materials and Methods).

With respect to claims 6-8 and 13, Thiaragian et al. teach using prokaryotes, such as E Coli bacteria to measure the oxygen, e.g. an analyte, consumption (See Abstract).

With respect to claim 9, the biostructure taught by Thiagarajan et al. is desiccation tolerant since the process involving dryness. (page 308, first paragraph)

With respect to claim 11-12 and 22, the bioreactor of Villaverde et al. contains detector, electrodes (See Figure 1).

With respect to claim 16-17, Thiagarajan et al. teach using porous latex of immobilizing bacteria (See Materials and Method).

With respect to claims 18-21, Thiagarajan et al. teach using the TFPR plate as the substrates for growing E Coli. (See Materials and Method).

With respect to claim 22 and 108, the biostructure taught by Thiagarajan et al. include wires and electrodes for detection and recording signals (See Figures 6-8).

With respect to claim 23-24, Thiagarajan et al. teach that the thickness of the cell layer is approximately 70 microns which is less than 500 microns within the range of the instant invention (See page 306, first paragraph).

With respect to claim 48, 100, 102-104, 106-107, the device of Thiagarajan et al. is a bioreactor for detection of the oxygen consumption, growth rate or gene expression from the E Coli (See page 304, last paragraph). The response by the E Coli can be recorded by electronic signals (See Figure 6-8).

4. Claims 14 and 105 are rejected under 35 U.S.C. 103(a) as being unpatentable over Thiagarajan et al. in view of Foster et al., and further in view of Cantwell et al. (EP 0288203).

Both Thiagarajan et al. and Foster et al. references have been discussed but are silent in teaching use of a cross-lined latex polymer. Cantwell et al. teach a composite biostructure comprising imbedding cells on the latex polymers (See Abstract). Cantwell et al. teach using different forces for better immobilizing cells on the latex polymers, including cross-linkage method for enhancement of immobilization (See page 2, line 25-30). Therefore, it would have been obvious to one ordinary skill in the art at the time the invention was made to have provided Thiagarajan and Foster et al. with the cross-linked

Art Unit: 1641

latex as taught by Cantwell et al. to increase the immobilizing efficiency in the biostructure.

5. Claim 109 is rejected under 35 U.S.C. 103(a) as being unpatentable over Thiagarajan et al. in view of Foster et al., and further in view of Martens et al. (Analytica Chimica Acta 1994 Vol. 292: 49-63).

Both Thiagarajan et al. and Foster et al. references have been discussed but are silent in teaching use a porous sealant layer to protect the biostructure.

Martens et al. teach use of a dialysis membrane, e.g. porous sealant layer, to cover the biostructure biofilm for subsequent analysis (See page 53, right column, first paragraph). Therefore, it would have been obvious to one ordinary skill in the art at the time the invention was made to have provided Thiagarajan and Foster et al. with the porous sealant layer as taught by Martens et al. to protect the biostructure for subsequent analysis since it merely involves routine skill in the art.

Response to Applicant's Arguments

6. Applicant's arguments with respect to claims 1-24, 48, 100-110 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

7. No claim is allowed.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jacob Cheu whose telephone number is 571-272-0814. The examiner can normally be reached on 9:00-5:00.

Art Unit: 1641

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Long Le can be reached on 571-272-0823. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Jacob Cheu

Examiner

Art Unit 1641



March 3, 2005



LONG V. LE
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1600

03/07/05